

before the master may approve operations involving the use of fire, open flame, or spark- or arc-producing equipment in that hold or adjacent space.

#### § 148.407 Smoking.

When Table 148.10 of this part associates a material with a reference to this section, and that material is being loaded or unloaded, smoking is prohibited anywhere on the weatherdeck of the vessel. While such a material is on board the vessel, smoking is prohibited in spaces adjacent to the cargo hold and on the vessel's deck in the vicinity of cargo hatches, ventilator outlets, and other accesses to the hold containing the material. "NO SMOKING" signs must be displayed in conspicuous locations in the areas where smoking is prohibited.

#### § 148.410 Fire hoses.

When Table 148.10 of this part associates a material with a reference to this section, a fire hose must be available at each hatch through which the material is being loaded.

#### § 148.415 Toxic gas analyzers.

When Table 148.10 of this part associates a material with a reference to a paragraph in this section, each vessel transporting the material, other than an unmanned barge, must have on board a gas analyzer appropriate for the toxic gas listed in that paragraph. At least two members of the crew must be knowledgeable in the use of the equipment. The equipment must be maintained in a condition ready for use and calibrated according to the instructions of its manufacturer. The atmosphere in the cargo hold and adjacent spaces must be tested before a person is allowed to enter these spaces. If toxic gases are detected, the space must be ventilated and retested before entry. The toxic gases for which the requirements of this section must be met are:

- (a) Arsine;
- (b) Carbon monoxide;
- (c) Hydrogen cyanide;
- (d) Hydrogen sulfide;
- (e) Phosphine; and
- (f) Sulfur dioxide.

#### § 148.420 Flammable gas analyzers.

When Table 148.10 of this part associates a material with a reference to a paragraph in this section, each vessel transporting the material, other than an unmanned barge, must have on board a gas analyzer appropriate for the flammable gas listed in that paragraph. At least two members of the crew must be knowledgeable in the use of the equipment. The equipment must be maintained in a condition ready for use, capable of measuring 0 to 100 percent LFL for the gas indicated, and calibrated in accordance with the instructions of its manufacturer. The atmosphere in the cargo hold must be tested before any person is allowed to enter. If flammable gases are detected, the space must be ventilated and retested before entry. The flammable gases for which the requirements of this section must be met are:

- (a) Carbon monoxide;
- (b) Hydrogen; and
- (c) Methane.

#### § 148.435 Electrical circuits in cargo holds.

During transport of a material that Table 148.10 of this part associates with a reference to this section, each electrical circuit terminating in a cargo hold containing the material must be electrically disconnected from the power source at a point outside of the cargo hold. The point of disconnection must be marked to prevent the circuit from being reenergized while the material is on board.

#### § 148.445 Adjacent spaces.

When transporting a material that Table 148.10 of this part associates with a reference to this section, the following requirements must be met:

- (a) Each space adjacent to a cargo hold must be ventilated by natural ventilation or by ventilation equipment safe for use in an explosive gas atmosphere.
- (b) Each space adjacent to a cargo hold containing the material must be regularly monitored for the presence of the flammable gas indicated by reference to § 148.420 of this part. If the level of flammable gas in any space reaches 30 percent of the LFL, all electrical equipment that is not certified